REMARKS/ARGUMENTS

Oath/Declaration

ITEM 2

Applicants acknowledge that the oath/declaration is deemed defective. A non-defective oath/declaration is being prepared and will be filed in a forthcoming submission.

Specification

ITEMS 5-9

The abstract is deemed to be defective.

Applicants amend the abstract as suggested in the office action, and as such, applicants assert the amended abstract conforms to U.S. patent practice.

Claim Rejection – 35 USC 102

ITEMS 10-11

Claims 6-10 stands rejected under 35 U.S.C. 102(b) as being anticipated by Kunzman (US 2002/0122160)

The applicants submit that these claims are not anticipated by Kunzman.

Claims 6-7

Claim 6 and its dependent claim 7 have been deemed unpatentable as being anticipated by Kunzman. Kunzman discloses (see notably paragraph 94, fig.9) a color wheel 92 for an imager color sequential illumination system, the wheel comprising at least three transmissive segments R 920, G 921, B 922, W 923 that are suitable for obtaining successive beams of different colors R, G, B, W when the segments scroll sequentially through a zone of transmission of an illumination beam ("white light from the light source 90"), the segments being of different colors, each segment having a hue, a saturation, a transmissivity or a reflectivity, and a size that is suitable for obtaining a colored beam exhibiting a reference hue when it crosses the zone of

transmission of the illumination beam. In Kunzman, as the different colored beams are used to illuminate successively a Spatial Light Modulator DMD 95, the colored beams are spatially modulated (paragraph 94) such that color pixels are obtained.

Kunzman, however, does not disclose the measurement of the excitation energies of the successive colored beams R, G, B, W as in claims 6 and 7. As a matter of fact, Kunzman considers, without measurement, the excitation energies of the successive components R-G-B-W of each pixel (§ 40).

Further, Kunzman does not disclose "distributing the colored segments over the color wheel in an order such that the differences of measured excitation energies between any two successive colored beams that follow one another, when the segments scroll in the order through the transmission zone, are the least variable possible" as in claim 6. Instead, Kunzman discloses transferring (i.e. distributing), on a pixel-to-pixel basis, as much of the energy as possible from the colored segments (as a whole : R 920, G 921, B 922) into the white segment W 923 (see notably paragraph 11 and 58), at least for the black-and-white areas of the images to display, in order to minimize the energy (see § 10, 54, 58) of the three color segments (as a whole) to the benefit of the energy of the white segment. More precisely, at the end of paragraph 94 of Kunzman, it is stated : "The display's data path processing electronics 96 implements the algorithm of this invention in conjunction with the single-DMD color filtering technique described above, on a pixel-by-pixel basis, to effectively allow for a trade-off between color separation artifact reduction and overall image brightness."

Applicants respectfully point out that such a trade-off to which the office action refers is totally different from the trade-off, if any, of the invention, because the trade-off is implemented in Kunzman by transferring (i.e. distributing), on a pixel-to-pixel basis, as much of the energy as possible from the colored segments (as a whole : R 920, G 921, B 922) into the white segment W 923 (see notably paragraph 11 and 58). In sharp contrast, Applicants' trade-off, if any, is implemented by "distributing the colored segments over the color wheel in an order such that the differences of measured excitation energies between any two successive coloured beams that follow one another, when the segments scroll in the order through the transmission zone, are the least variable possible".

Consequently, the invention claims the (geometrical) distribution of segments over the color wheel in a specific geometrical order, while Kunzman discloses a method of distributing energy. The office action points to § 49 as disclosing a selection of the order of distribution of segments over the color wheel. However, Applicants do not believe that there a connection between such a selection, if any, and the criteria disclosed in § 10, 54, 58 (minimizing the energy of the three color segments, as a whole, to the benefit of the energy of the white segment), because this criteria does not influence, in Kunzman, the selection of the order of distribution of segments over the color wheel.

Further, the distribution of segments of the invention is performed on a colored beam basis, while the distribution of energy of Kunzman is performed on a pixel-by-pixel basis (§ 58). In the invention as claimed, the distribution of segments over the color wheel in a specific order aims at having differences of measured excitation energies between any two successive colored beams the least variable possible. The distribution of energy of Kunzman, on the other hand, is adapted :

- for black-and-white areas of the images to display, in order to minimize the energy of the three color segments (as a whole) to the benefit of the energy of the white segment (see § 54, 58);
- for colored areas of the images to display, in order to maximize the brightness (see § 15, 58), by a distribution of the energy over the three color segments (as a whole) and the white segment.

In light of differences between the features in claim 6 and the features of Kunzman and the fact that Kunzman does not disclose all of the features of claim 6, Applicants assert that claim 6 is patentable over Kunzman.

Regarding claim 7, it includes the features of claim 6 and includes the additional feature of distributing the segments over the colored wheel in such a way that the sum of the differences of energies between any two successive colored beams is the lowest possible. Kunzman, on the other hand, discloses a color wheel furnished with a determined number of segments each having a determined dimension and making it possible to obtain a determined global color temperature (§ 56, 57). Kunzman does not disclose, as there is no mention, even implicit, of such criterion (i.e., lowering a sum of differences of energy). Moreover, the only energies that are considered in Kunzman are not related to colored beams, but to pixels.

ITEMS 12-13

Claims 1-5 stands rejected under 35 U.S.C. 103 as being obvious.

Claims 1-5

Claims 1-5 in the application stands rejected under 35 U.S.C. §103 as being unpatentable over Kunzman (US 2002/0122160) in view of Tanaka (JP 07-318939). The applicants submit that these claims are not rendered obvious by the combination of these references.

Kunzman discloses (§ 94 with fig. 9) an imager sequential illumination system comprising:

- a source 90 emitting towards the imager a polychromatic light beam ("white light from the light source") in a wavelength range comprising at least three primary colours R, G, B, W, and

- a device ("color wheel" 92) for scrolling colored segments comprising at least three transmissive segments R 920, G 921, B 922, W 923, the scrolling device making it possible to scroll the said segments over the optical path of the said polychromatic light beam ("white light from the light source") so that they successively cut the direction of propagation of the beam in the case where the segments are transmissive, the segments being of different colors R, G, B, W, and each segment having a hue, a saturation, a transmissivity or a reflectivity, and a size that is suitable for obtaining a colored beam exhibiting a primary colour with a reference hue when it is scrolled over the optical path of the said polychromatic light beam.

In the office action, it is asserted that Kunzman discloses all of the features of claim 1 with the exception of the feature of a source that is polychromatic with at least three primary colors. To overcome the deficiency in Kunzman, Tanaka is used.

Applicants, however, point out that Kunzman and Tanaka even fail to consider the excitation energies of the colored beams R, G, B, W. In fact, Kunzman considers the excitation energies of the successive components R-G-B-W of each pixel (§ 40). Claims 1-5 require a consideration of the energies of colored beams.

Further, Kunzman and Tanaka fail to disclose "distributing the colored segments in the scrolling device in an order such that the differences of energies between any two successive colored beams that follow one another when the segments scroll over the optical path of the

polychromatic light beam are the least variable possible," which is a feature of claims 1-5. Instead, Kunzman discloses transferring (i.e. distribute), on a pixel-to-pixel basis, as much of the energy as possible from the colored segments (as a whole : R 920, G 921, B 922) into the white segment W 923 (see notably paragraph 11 and 58), at least for the black-and-white areas of the images to display, in order to minimize the energy of the three color segments (as a whole) to the benefit of the energy of the white segment (see § 54, 58).

Because the combined features Kunzman and Tanaka fail to disclose all of the features in any of claims 1-5 and there is an omission has how one could predict the features in claims 1-5 based on features in the cited references, Applicants assert that claims 1-5 are patentable and respectfully request reconsideration.

Regarding claim 2, it includes the features of claim 1 and includes the additional feature of distributing the colored segments in such a way that the sum of the differences of energies between any two successive colored beams is the lowest possible. Kunzman, on the other hand, discloses a color wheel furnished with a determined number of segments each having a determined dimension and making it possible to obtain a determined global color temperature (§ 56, 57). Kunzman and Tanaka do not disclose, as there is no mention, even implicit, of such criterion (i.e., lowering a sum of differences of energy). Moreover, the only energies that are considered in Kunzman are not related to colored beams, but to pixels. As such, Kunzman in view of Tanaka do not make claim 2 unpatentable.

Conclusion

In light of the above assertions, Applicants request reconsideration of the rejections and entry of the amendments to the claims.

If the Examiner has any questions or comments that would facilitate the disposition or resolution of the issues, the Examiner is respectfully requested to contact the undersigned at 609-734-6816.

Please charge a one-month extension fee and any other fees associated with the application to Deposit Order Account No. 07-0832.

PF040024

Respectfully submitted,
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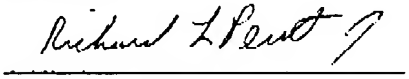
Applicants



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